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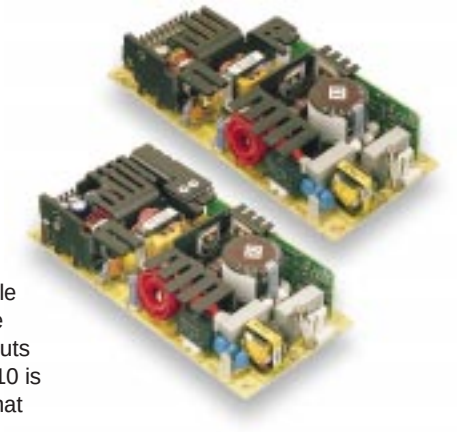
Jameco Part Number 218931 (NLP110-9624)

NLP110 Series

Single and triple output

ARTESYN TECHNOLOGIES

- **Provides low voltage outputs**
- **Compliance to EN61000-3-2 (Power Factor = 0.98)**
- **Smallest industry standard package 6.5 x 3.0 x 1.26 inches**
- **90VAC to 264VAC universal input range**
- **UL, CSA and VDE safety approvals and CE-Marked to LVD**
- **Overvoltage and short circuit protection**
- **VDE0871-B, EN55022-B, EN55011-B conducted noise**
- **VDE0871-A, EN55022-A, EN55011-A radiated noise**
- **Meets all applicable and relevant immunity standards EN61000-4-2,4,5 and 6**



The NLP110 is a series of 110W AC/DC open frame power supplies in a 3 x 6.5 x 1.26 inch package. The NLP110 is power factor corrected to meet EN61000-3-2 and is available in single and multiple output models. The multiple output models have a capability that is unique to the power supply market - they can deliver equal amounts of current on multiple low voltage outputs to support designs that will span the industry transition from 5V logic to 3.3V logic. The NLP110 is practically the same size as a 65 Watt 3 x 5 inch product, e.g. NLP65 - the one difference is that the footprint is a mere 1.5 inches longer. The NLP110 is primarily designed for networking applications in 1U shelves or boxes that have a heavy logic content such as access concentrators, midrange routers, LAN switches and shared media hubs. The availability of single output models with high peak load capability also means that the NLP110 can provide a power factor corrected solution for applications currently using the NFS110.

2 YEAR WARRANTY

All specifications are typical at nominal input, full load at 25°C unless otherwise stated

SPECIFICATIONS

OUTPUT SPECIFICATIONS

Total regulation (Line and load)	Main output Auxiliary outputs	±2.0% ±5.0%
Rise time	At turn-on	1.0s, max.
Transient response	Main output 75% to 100% step at 0.1A/µs	5.0% or 250mV max. dev., 1ms max. recovery to 1%
Temperature coefficient		±0.02%/°C
Overvoltage protection	Main outputs	125%, ±10%
Short circuit protection	Cyclic operation	Continuous
Minimum output current	Single and multiple	See table

INPUT SPECIFICATIONS

Input voltage range (See Note 6)	Universal input	90 to 264VAC
Input frequency range		47Hz to 63Hz
Input surge current (cold start)	120VAC 230VAC	18A max. 35A max.
Safety ground leakage current	120VAC, 60Hz 230VAC, 50Hz	0.45mA 0.75mA
Input current	120VAC @ 80W 120VAC @ 110W 230VAC @ 80W 230VAC @ 110W	0.9A rms 1.3A rms 0.48A rms 0.7A rms
Input fuse	UL/IEC127	F3.15A H, 250VAC

EMC CHARACTERISTICS (12)

Conducted emissions	EN55022, FCC part 15	Level B
Radiated emissions	EN55022, FCC part 15	Level A
Harmonic current emission correction	EN61000-3-2	Compliant
ESD air	EN61000-4-2	Level 3
ESD contact	EN61000-4-2	Level 3

EMC CHARACTERISTICS (continued)

Surge	EN61000-4-5	Level 3
Fast transients	EN61000-4-4	Level 3
Radiated immunity	EN61000-4-3	Level 3
Conducted immunity	EN61000-4-6	Level 3

GENERAL SPECIFICATIONS

Hold-up time	120VAC, 60Hz	16.7ms @ 110W
Efficiency	120VAC, 80W (-9605)	75% min.
Isolation voltage	Input/output Input/chassis	3000VAC 1500VAC
Approvals and standards pending		EN60950, VDE0805, IEC950, UL1950, CSA C22.2 No. 950,
Weight		283g (10oz)
MTBF (@ 25°C)	MIL-HDBK-217F	220,000 hours min.

ENVIRONMENTAL SPECIFICATIONS (9)

Thermal performance	Operating ambient, (See derating curve) Non-operating 50°C to 70°C, ambient, convection cooled 0°C to 50°C, ambient, convection cooled 0°C to 50°C ambient, 150LFM forced air Peak (0°C to +50°C, 60s)	0°C to +50°C -40°C to +85°C Derate to 50% load 80W 110W (See Note 3)
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating Non-operating	10,000 feet max. 30,000 feet max.
Vibration (See Note 8)	5Hz to 500Hz	2.4G rms peak
Shock	per MIL-STD-810E	516.4 Part IV

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OUTPUT VOLTAGE	OUTPUT CURRENT				PEAK (4)	RIPPLE (5)	TOTAL REGULATION	MODEL NUMBERS
	MIN (6)	MAX (1)	150LFM (2)	300LFM (3)				
+5V	0.5A	15A	22A	22A	22A	50mV	±2.0%	NLP110-9605
+12V	0.3A	6.4A	9.2A	9.2A	11.5A	120mV	±2.0%	NLP110-9612
+48V	0A	1.6A	2.3A	2.3A	2.5A	240mV	±2.0%	NLP110-9617
+24V	0.2A	3.2A	4.6A	4.6A	6.0A	240mV	±2.0%	NLP110-9624
+5V (A)	0.5A	13A	16A	18A	18A	50mV	±2.0%	NLP110-9693
+3.3V (B)	0.2A	13A	16A	20A	20A	50mV	±2.0%	
+12V	0A	0.65A	1.0A	1A	1.0A	120mV	±5.0%	
+3.3V (A)	0.5A	13A	16A	20A	22A	50mV	±2.0%	NLP110-9694
+2.5V (B)	0.1A	13A	16A	20A	22A	50mV	±2.0%	
+12V	0A	0.65A	1.0A	1A	1.0A	120mV	±5.0%	
+12V (A)	0.2A	6.5A	8.5A	8.5A	10A	1200mV	±2.0%	NLP110-9695 (7)
+3.3V (B)	0.5A	13A	16A	20A	22A	50mV	±2.0%	
-12V	0A	0.65A	1.0A	1A	1.0A	120mV	±5.0%	
+12V (A)	0.2A	6.5A	8.5A	8.5A	10A	120mV	±2.0%	NLP110-9608 (7)
+5V (B)	0.2A	13A	16A	18A	22A	50mV	±2.0%	
-12V	0A	0.65A	1.0A	1A	1.0A	120mV	±5.0%	

Notes

1 Free air convection.
Multiple output units: maximum continuous output power not to exceed 80W.
For -9693; $I_{3.3V}$ = 13A max.; $I_{5.0V}$ = 13A max.; $I_{3.3V} + I_{5.0V} \leq 16A$.
For -9694; $I_{3.3V}$ = 13A max.; $I_{2.5V}$ = 13A max.; $I_{3.3V} + I_{2.5V} \leq 16A$
For -9695; $I_{3.3V}$ = 13A max.; I_{12V} = 6.5A max.; $I_{3.3V} + I_{12V} \leq 16A$.
For -9608; $I_{5.0V}$ = 13A max.; I_{12V} = 6.5A max.; $I_{5.0V} + I_{12V} \leq 16A$.
Single output units: maximum continuous output power not to exceed; 75W on –9605; 76.8W on –9612,-9624, and –9617.

2 150LFM forced air cooling from L4 side.
Multiple output units: maximum continuous output power not to exceed 105W.
For -9693; $I_{3.3V}$ = 16A max.; $I_{5.0V}$ = 16A max.; $I_{3.3V} + I_{5.0V} \leq 20A$.
For -9694; $I_{3.3V}$ = 16A max.; $I_{2.5V}$ = 16A max.; $I_{3.3V} + I_{2.5V} \leq 20A$
For -9695; $I_{3.3V}$ = 16A max.; I_{12V} = 8.5A max.; $I_{3.3V} + I_{12V} \leq 20A$.
For -9608; $I_{5.0V}$ = 16A max.; I_{12V} = 8.5A max.; $I_{5.0V} + I_{12V} \leq 20A$.
Single output units: maximum continuous output power not to exceed 110W for all models.

3 300LFM forced air cooling from L4 side.
Multiple output units: maximum continuous output power not to exceed 110W.
For -9693; $I_{3.3V}$ = 20A max.; $I_{5.0V}$ = 18A max.; $I_{3.3V} + I_{5.0V} \leq 22A$.
For -9694; $I_{3.3V}$ = 20A max.; $I_{2.5V}$ = 20A max.; $I_{3.3V} + I_{2.5V} \leq 22A$
For -9695; $I_{3.3V}$ = 20A max.; I_{12V} = 8.5A max.; $I_{3.3V} + I_{12V} \leq 22A$.
For -9608; $I_{5.0V}$ = 20A max.; I_{12V} = 8.5A max.; $I_{5.0V} + I_{12V} \leq 22A$.
Single output units: maximum continuous output power not to exceed 110W for all models.

4 Peak output current lasting less than 30 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.

5 Figure is peak-to-peak for convection power rating. Output noise measurements are made across a 20MHz bandwidth using a 6” twisted pair, terminated with a 10µF electrolytic capacitor and a 0.1µF ceramic capacitor.

6 Minimum load required for correct start-up and operation on single outputs and on main output of multiple versions. Failure to observe minimum load on main output will not allow the supply to start-up correctly. Some electronic test loads have a large delay time before they start drawing current even though the voltage from the supply is present. During this time delay, there is no load on the output and as a result, the supply cannot start-up properly and maintain its correct output voltage. In these instances, a dummy resistive load across the output may be necessary to load the output of the supply until the test load can function correctly and draw the intended minimum load. Minimum load required on auxiliary outputs to maintain regulation.

7 For models NLP110-9608 and NLP110-9695, the 12V output is floating. For -12V output, pin 11 on J2 has to be connected to Return making pin 12 the -12V output

8 Three orthogonal axes, random vibration 10 minutes for each axes, 2.4G rms 5Hz to 500Hz.

9 For optimum reliability, no part of the heatsink should exceed 110°C, and no semiconductor case temperature should exceed 120°C.

10 CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements.

11 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.

12 The EMI specifications reference measurements made with the power supply mounted on a grounded metal sheet extending 1 inch beyond each edge, using an unshielded cable. No external filtering required during conducted emissions testing but some applications may require additional filtering to achieve system compliance. A line choke, (AC input cords looped twice through an EMI suppression toroid) was used during radiated emissions testing. Considerable radiated testing in 1U six-sided boxes has shown that units can meet level B in typical systems. Application support is available from the factory to assist with EMI compliance.

13 All models require a minimum mounting stand-off of 6.35mm (0.25 inches) in the end use product.

International Safety Standard Approvals

VDE0805/EN60950/IEC950 File No. 10401-3336-1096.

UL1950 File No. E136005.

CSA C22.2 No. 950 File No. LR41062C.

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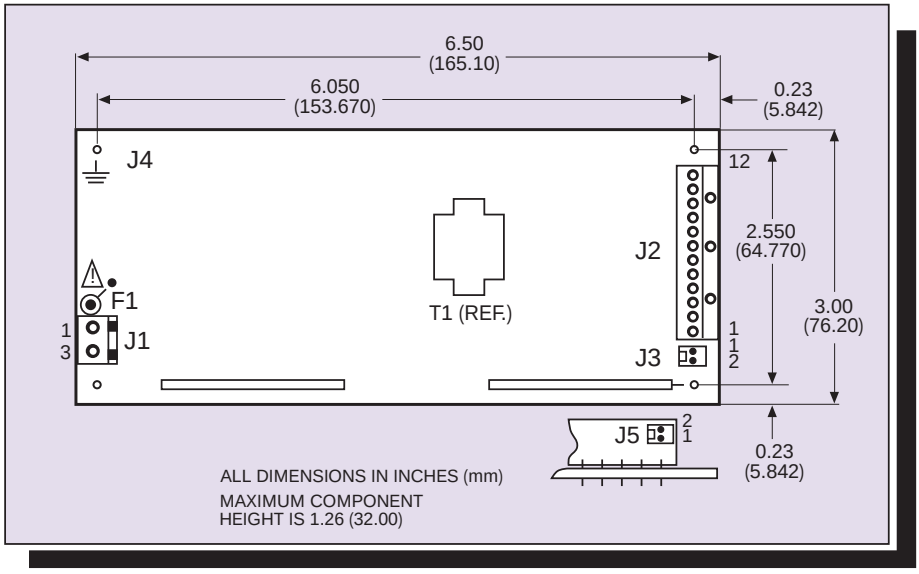
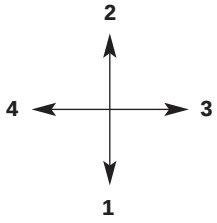
Mechanical Notes

A All dimensions are in inches (mm).



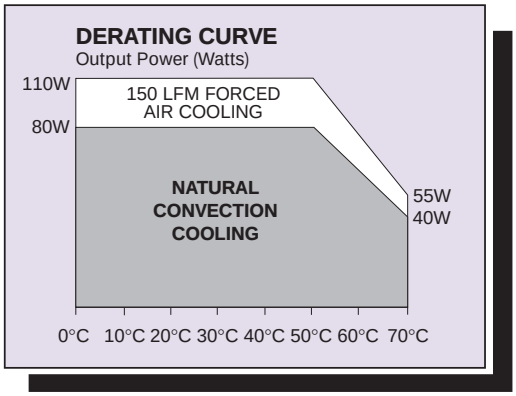


Recommended direction for forced air relative to power supply orientation shown below.

1 Optimum.
2 Very good.
3 Good.
4 Not recommended.

INPUT PIN CONNECTIONS	
J1	
Pin 1	AC Neutral
Pin 2	No Connection
Pin 3	AC Line
J3	
Pin 1	V (A) Sense +
Pin 2	V (A) Sense -
J4	
Pin 1	Safety Earth
J5	
Pin 1	V (B) Sense +
Pin 2	V (B) Sense -

OUTPUT PIN CONNECTIONS		
J2	SINGLE	TRIPLE
Pin 1	No Connection	V (B)
Pin 2	No Connection	V (B)
Pin 3	No Connection	V (B)
Pin 4	Return	Return
Pin 5	Return	Return
Pin 6	Return	Return
Pin 7	Return	Return
Pin 8	V (A)	V (A)
Pin 9	V (A)	V (A)
Pin 10	V (A)	V (A)
Pin 11	No Connection	V (C)
Pin 12	No Connection	V (C) Return (7)



Input and output connectors

AC (J1) connector type
Molex 26-60-4030 or equivalent.

DC (J2) connector type
12 position Molex Spox type 26-48-1125 or equivalent.

Sense (J3) connector type
Molex 22-23-2021 or equivalent.

Earth (J4) connector type
Male 0.250 quick disconnect.

Sense (J5) connector type
Leoco 2421P02H000.

Mating connectors

AC (J1) mating connector type
Molex 09-50-3031 or equivalent with Molex 08-50-0105 or equivalent crimp terminals.

DC (J2) mating connector type
Molex Spox type 26-03-3121 and contact 08-52-0113.

Sense (J3) mating connector type
Molex 22-01-3027 and contact 08-50-0113.

Earth (J4) mating connector type
Molex 90028.

Sense (J5) mating connector type
Leoco 2420S020000 and contact 2453TPB00V1.

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